thin-cap fibroatheroma (TCFA) neointima and calcified neointima were detected in 22 (43.1%), 19 (37.3%), and 5 (9.8%) patients. Neoatherosclerosis was more frequently observed in BMS (12/16, 75.0%) compared with DES (11/33, 33.3%) (p=0.013). The percentage of frames with neoatherosclerosis in the stent segment was higher in BMS (60.56% [38.36, 77.86] vs. 18.18% [12.50, 39.13], respectively, p=0.006). Maximum consecutive lipid neointima length was longer in BMS than in DES (5.5mm [3.0, 10.1] and 2.5mm [1.2, 4.5], p=0.022). There was no significant difference in the minimum fibrous cap thickness (53.3μm [53.3, 60.0] and 50.0μm [45.5, 53.3], respectively, p=0.152).

CONCLUSIONS Neoatherosclerosis was the common mechanism of VLST in both type of stents, however it was more prevalent and diffuse in BMS . DES had a wide variety mechanisms such as uncovered strut, malapposed strut and neoatherosclerosis. The indication of intravascular imaging is necessary for the case with VLST because the heterogeneity of underlying mechanism is present.

The case with neoatherosclerosis	Overall N=23	DES N=11	BMS N=12	P value
Stent length, mm	21.6 (12.2, 35.5)	31.4 (17.8, 36.4)	16.1 (10.7, 30.9)	0.06
Stent area, mm^2	8.70 (6.34, 10.41)	6.93 (5.89, 9.11)	9.05 (7.83, 10.86)	0.053
Frame percentage with Neoatherosclerosis,%	39.13 (12.73, 64.71)	18.18 (12.50, 39.13)	60.56 (38.36, 77.86)	0.006
Frame percentage with Lipid neointima,%	39.13 (12.73, 55.17)	18.18 (9.38, 39.13)	52.19 (38.36, 64.85)	0.007
Frame percentage with TCFA neointima,%	4.92 (2.08, 21.43)	4.35 (1.82, 8.93)	17.57 (2.82, 30.00)	0.131
Frame percentage with Calcified neointima,%	0.00 (0.00, 0.00)	0.00 (0.00, 1.96)	0.00 (0.00, 0.00)	0.765
Total lipid neointima length,mm	5.4 (3.2, 8.0)	4.5 (2.4, 6.0)	7.4 (4.1, 13.5)	0.096
Maximum lipid neointima consecutive length, mm	3.0 (2.4, 6.0)	2.5 (1.2, 4.5)	5.5 (3.0, 10.1)	0.022
Minimum FC thickness,μm	53.3 (46.7, 60.0)	53.3 (53.3, 60.0)	50.0 (45.0, 53.3)	0.152

CATEGORIES IMAGING: Intravascular

KEYWORDS Neoatherosclerosis, Optical coherence tomography, ST-Stent Thrombosis

TCT-340

Impact of Side Branches Modeling on Computation of Endothelial Shear Stress in Coronary Artery Disease: a Novel Method for Patient-Specific Coronary Tree Reconstruction by Fusion of X-ray Angiography and Optical Coherence Tomography

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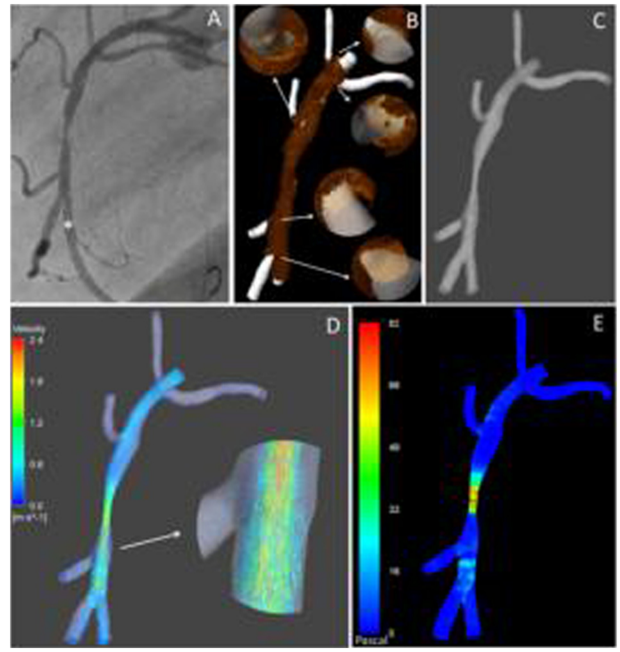
BACKGROUND Computational fluid dynamics allow virtual evaluation of coronary physiology and shear stress (SS). Most studies hitherto assumed the vessel as a single conduit without accounting for the flow through side branches. Our aim was to develop a new approach to reconstruct coronary geometry that also computes outgoing flow through side branches in hemodynamic and biomechanical calculations, using fusion of optical coherence tomography (OCT) and 3-Dimensional (3D) angiography.

METHODS Twenty-one patients enrolled in the DOCTOR Fusion study underwent OCT and 3D-angiography of the target vessel (9 LAD, 2 LCX, 10 RCA). Coronary 3D reconstruction was performed by fusion of OCT and angiography, creating a true anatomical tree model (TM) including the side branches, and a traditional single-conduit model (SCM) disregarding the side branches. Figure legend: (A) Angiography of a RCA, with an OCT pullback starting at *. (B) Fusion of 3D angiography and OCT luminogram, using side branches to correct for longitudinal and rotational mismatch. (C) Coronary tree model resulting from merging the OCT of the RCA with the 3D-angiography of the side branches. (D) Simulated flow velocity. (E) Regional map of computed endothelial SS.



RESULTS Pd/Pa ratio was significantly higher in TMs than in SCMs (0.904 vs. 0.842, $p < 0.0001$). Agreement between TM and SCM in identifying patients with a Pd/Pa ratio ≤ 0.80 under basal flow conditions was only $k = 0.417$ ($p = 0.019$). Average SS was 4.64 Pascal lower in TMs than in SCMs ($p < 0.0001$), with marked differences in the point-per-point comparison, ranging from -60.71 to 7.47 Pascal.

CONCLUSIONS True anatomical TMs that take into account the flow through side branches are feasible for accurate hemodynamic and biomechanical calculations. Traditional SCMs underestimate Pd/Pa and are inaccurate for regional SS estimation. Implementation of TMs might improve the accuracy of SS and virtual fractional flow reserve calculations, thus improving the consistency of biomechanical studies.

CATEGORIES IMAGING: Intravascular

KEYWORDS Endothelial shear stress, Fractional flow reserve, Optical coherence tomography

TCT-341

Thrombus And Plaque Erosion In Patients With Vasospastic Angina Using Optical Coherence Tomography

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BACKGROUND In patients with vasospastic angina (VSA), transient local hemodynamic changes due to vasospasm can result in endothelial damage and thrombus formation. However, its incidence has not been well-defined yet. The aim of this study was to evaluate the incidence of thrombus and plaque characteristics at coronary spasm segments compared to non-spasm segments in patients with suspicious VSA using optical coherence tomography (OCT).

METHODS One hundred and thirty three patients with suspected VSA were included in this study. The ergonovine provocation test was performed in all patients for the diagnosis of VSA except patients with spontaneous spasm. All target lesions were analyzed by OCT.

RESULTS 77 spasm segments in 66 VSA patients were compared with 46 non-spasm segments in 30 non-VSA patients. Thrombus was seen more frequently at spasm segments compared to non-spasm segments